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What is claimed:

1. A parallel divided flow fluid supply apparatus, comprising:

a pressure regulator having an upstream side and a downstream side;

a plurality of parallel flow passages disposed downstream of said pressure regulator, wherein a single flow fluid from said pressure regulator is branched into said parallel flow passages;

a plurality of flow control valves disposed in said flow passages; and

a plurality of time delay mass flow controllers for controlling of the flow rate, one controller installed on each flow passage between two of said flow control valves disposed upstream and downstream of said controller respectively, wherein said time delay-type mass flow controller on a flow passage is so set that when the mass flow controller is actuated to open the passage for a steady flow state at a preset flow rate, a delay time is allowed for the flow rate to rise from the starting point to the preset flow rate value.

2. A parallel divided flow fluid supply apparatus as defined in claim 1, wherein said delay time is adjustable.

3. A parallel divided flow fluid supply apparatus as defined in claim 1, wherein said time delay mass flow controller comprises:

a sensor section disposed immediately downstream of the upstream flow control valve of said controller for detecting an instantaneous flow rate of fluid coming through the upstream flow control valve; wherein said sensor section comprises an upstream

sensor for generating heat and a downstream sensor for detecting the heat generated by said upstream sensor;

a means connected to said sensor section for calculating an instantaneous flow rate using signals from said sensor section;

an amplifier connected to said calculating means for amplifying the signals from said calculating means;

a valve open/close detector connected to the downstream flow control valve of said controller for detecting an open/close state of both downstream and upstream flow control valves of said controller;

a time delay unit connected to said valve detector for setting a delay time period during which the instantaneous flow rate gradually increases;

a flow rate setter connected to said time delay unit for setting a set flow rate, wherein the set flow rate will be reached during the delay time period set by said time delay unit;

a comparison circuit disposed between said amplifier and said time delay unit for comparing the instantaneous flow rate from said amplifier with the set flow rate set by said flow rate setter and outputting difference signals;

a means disposed next to said comparison circuit for receiving the outputting difference signals and displaying the outputting difference signals; and

a valve unit disposed downstream of said sensor section and connected to said comparison circuit for increasing the flow rate gradually up to the set flow rate according to signals from said comparison circuit.

4. A parallel divided flow fluid supply apparatus, comprising:

a pressure regulator having an upstream side and a downstream side;

a plurality of parallel flow passages disposed downstream of said pressure regulator, wherein a single flow fluid from said pressure regulator is branched into said parallel flow passages;

a plurality of flow control valves disposed in said flow passages; and

a plurality of pressure flow control systems for controlling of the flow rate, one controller installed on each flow passage between two of said flow control valves disposed upstream and downstream of said controller respectively.

5. A parallel divided flow fluid supply apparatus of claim 4, wherein said pressure-type flow control system comprises:

an orifice formed downstream of said control system and upstream of the downstream flow control valve for discharging fluid from the flow passage;

a control valve installed upstream of said orifice and downstream of the upstream flow control valve of said control system for controlling the flow rate of the fluid;

a pressure detector disposed between said orifice and said control valve for detecting the pressure P_1 between said control valve and said orifice;

a calculation control circuit wherein with a pressure on an upstream side of said orifice set to be twice or more higher than a pressure on a downstream side of said orifice, the instantaneous flow rate is calculated as $Qc = KP_1$ (K = constant) from the pressure on the upstream side of said orifice detected by said pressure detector and a

difference between an instantaneous flow rate Qc and a preset flow rate Qs is outputted as control signal Qy; and

a drive connecting said control valve and said calculation control circuit for receiving the control signals from said calculation control circuit and sending the control signals to said control valve causing said control valve operating to bring the control signal Qy to zero.

6. A flow factor-based fluid-switchable pressure flow control method, comprising: calculating a flow rate Qc of gas passing through an orifice according to formula $Qc = KP_1$ (wherein K = constant) with a pressure P_1 on an upstream side of the orifice set at twice or more higher than a pressure P_2 on a downstream side, wherein a flow factor FF for each kind of gas is calculated as follows:

$$FF = (k/\gamma s)\{2/(\kappa + 1)\}^{1/(\kappa - 1)}[\kappa/\{(\kappa + 1)R\}]^{1/2}$$

wherein:

γs = concentration of gas in standard state;

κ = ratio of specific heat of gas;

R = constant of gas; and

K = proportional constant not depending on the type of gas;

and, wherein, if a calculated flow rate of a gas type A is Q_A and gas type B is allowed to flow through the same orifice under the same pressure on an upstream side and at the same temperature on the upstream side, a flow rate Q_B is calculated as follows:

$$Q_B = (FF_B/FF_A)Q_A$$

wherein:

FF_A = flow factor of gas type A; and

FF_B = flow factor of gas type B.

7. A flow factor-based fluid-switchable pressure flow control system, comprising:

a control valve for controlling the flow rate of the fluid;

an orifice formed downstream of said control valve for discharging fluid,

a pressure detector disposed between said control valve and said orifice for detecting a pressure between said control valve and said orifice; and

a flow rate setting circuit, wherein a pressure P_1 on an upstream side is held to be about twice or more higher than a downstream pressure P_2, a flow rate Qc of a specific gas type A is calculated as $Qc = KP_1$ (K: constant), wherein the control valve is controlled to open or close according to a difference signal between the calculated flow rate Qc and a set flow rate Qs, wherein storage means are provided for storing a flow factor ratio of gas type A to gas type B (FF_B/FF_A) calculated for each gas as follows:

$$FF = (k/\gamma s)\{2/(\kappa + 1)\}^{1/(\kappa - 1)}[\kappa/\{(\kappa + 1)R\}]^{1/2}$$

wherein:

γs = concentration of gas in standard state

κ = ratio of specific heat of gas;

R = constant of gas; and

K = proportional constant not depending on the type of gas;

and further comprising calculation means wherein, if a calculated flow rate of gas type A is Q_A, and, when gas type B is allowed to flow through a same orifice under a same pressure on an upstream side and at a same temperature on an upstream side, flow rate Q_B is calculated as follows:

$$Q_B = (FF_B/FF_A)Q_A.$$

8. A parallel divided flow fluid supply apparatus, comprising:

a pressure regulator having an upstream side and a downstream side;

a plurality of parallel flow passages disposed downstream of said pressure regulator, wherein a single flow fluid from said pressure regulator is branched into said parallel flow passages;

a plurality of flow control valves disposed in said flow passages; and

a plurality of flow factor-based fluid switchable pressure flow control systems for controlling of the flow rate, one controller installed in each flow passage between two of said flow control valves disposed upstream and downstream of said controller respectively;

wherein said controller comprises:

a control valve for controlling a flow rate of the fluid;

an orifice formed downstream of said control valve for discharging the fluid;

a pressure detector disposed between said control valve and said orifice for detecting pressure between said control valve and said orifice; and

a flow rate setting circuit, wherein pressure P_1 on an upstream side is held to be about twice or more higher than a downstream pressure P_2, and the flow rate Qc of a specific gas type A can be calculated as $Qc = KP_1$ (K: constant), wherein the control valve is controlled to open or close according to a difference signal between a calculated flow rate Qc and a set flow rate Qs, further comprising a storage means for storing a flow factor ratio of gas type A to gas type B (FF_B/FF_A) which is calculated for each kind of gas as follows:

$$FF = (k/\gamma s)\{2/(\kappa + 1)\}^{1/(\kappa-1)}[\kappa/\{(\kappa + 1)R\}]^{1/2}$$

wherein:

γs = concentration of gas in standard state;

κ = ratio of specific heat of gas;

R = constant of gas;

K = proportional constant not depending on the type of gas; and

further comprising calculation means if a calculated flow rate of gas type A is Q_A, and, gas type B is allowed to flow through a same orifice under a same pressure on an upstream side and at a same temperature on an upstream side, a flow rate for gas B Q_B is calculated as follows:

$$Q_B = (FF_B/FF_A)Q_A.$$